

## Chapter 4 Atomic Structure

**Section 4.1 Studying Atoms****(pages 100-105)***This section discusses the development of atomic models.***Reading Strategy (page 100)**

**Summarizing** As you read, complete the table about atomic models. For more information on this Reading Strategy, see the **Reading and Study Skills** in the **Skills and Reference Handbook** at the end of your textbook.

Atomic Models		
Scientist	Evidence	Model
	Ratio of masses in compounds	
	Deflected beam	
Rutherford		Positive, dense nucleus

**Ancient Greek Models of Atoms (page 100)**

- Democritus named the smallest particles of matter \_\_\_\_\_ because they could not be divided.
- List the four elements that Aristotle included in his model of matter.
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_

**Dalton's Atomic Theory (page 101)**

- Is the following sentence true or false? John Dalton gathered evidence for the existence of atoms by measuring the masses of elements that reacted to form compounds. \_\_\_\_\_
- What theory did Dalton propose to explain why the elements in a compound always join in the same way? \_\_\_\_\_  
\_\_\_\_\_
- Circle the letters of the sentences that represent the main points of Dalton's theory of atoms.
  - All elements are composed of atoms.
  - In a particular compound, atoms of different elements always combine the same way.
  - All atoms have the same mass.
  - Compounds contain atoms of more than one element.

**Chapter 4 Atomic Structure****Thomson's Model of the Atom (pages 102–103)**

6. Objects with like electric charges \_\_\_\_\_, and objects with opposite electric charges \_\_\_\_\_.
7. What happened to the beam when Thomson placed a pair of charged metal plates on either side of the glass tube? \_\_\_\_\_
8. Thomson concluded that the particles in the glowing beam had a(n) \_\_\_\_\_ charge because they were attracted to a positive plate.
9. Is the following sentence true or false? Thomson's experiments provided the first evidence for the existence of subatomic particles. \_\_\_\_\_
10. Describe Thomson's model. \_\_\_\_\_

**Rutherford's Atomic Theory (pages 104–105)**

11. What is an alpha particle? \_\_\_\_\_
12. Fill in the table to show what Rutherford hypothesized would happen to the paths of alpha particles as they passed through a thin sheet of gold.

Rutherford's Hypothesis	
Most particles would travel _____ from their source to a screen that lit up when struck.	Particles that did not pass straight through would be _____

13. Circle the letters of the sentences that describe what happened when Marsden directed a beam of particles at a piece of gold foil.
- Fewer alpha particles were deflected than expected.
  - More alpha particles were deflected than expected.
  - None of the alpha particles were deflected.
  - Some alpha particles bounced back toward the source.
14. Circle the letter of the sentence that states what Rutherford concluded from the gold foil experiment.
- An atom's negative charge is concentrated in its nucleus.
  - Thomson's model of the atom was correct.
  - An atom's positive charge is concentrated in its nucleus.
  - An atom's positive charge is spread evenly throughout the atom.